Atty. Dkt. No. AT9-96-312

PATENTS

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: David C. Dryer et al.

Serial No.: 08/767,928

Filing Date: December 17, 1996

Group Art Unit: ~~2312~~ 2762

Examiner: W. Starks

For: **SELECTION OF GRAPHICAL USER INTERFACE AGENTS BY CLUSTER ANALYSIS**

TRANSMITTAL OF APPELLANTS' BRIEF UNDER 37 CFR 1.192(a)

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Attached is Appellants' Brief, in triplicate, per their Notice of Appeal mailed August 8, 2000 and received August 11, 2000, appealing a decision of the Examiner, mailed May 10, 2000, finally rejecting the claims remaining in the case.

Please charge IBM's Deposit Account No. 09-0447 in the amount of $3/0.00, the fee for filing this Appeal Brief.

006372.00192

The Commissioner is hereby authorized to charge any additional fee which may be required or credit any overpayment to Deposit Account No. 09-0447. A duplicate copy of this document is enclosed.

Respectfully submitted,

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Registration No. 28,191

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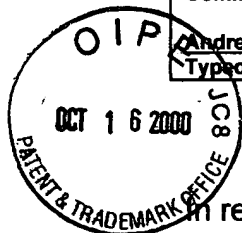
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For: Selection of Graphical User Interface Agents
                                 by Cluster Analysis

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APPEAL BRIEF

Dear Sir:

This is an appeal from the Examiner's Office Action mailed May 10, 2000 finally rejecting claims 1-8 and objecting to claim 9 of the above-identified application. An appendix containing a copy of each rejected claim and the one claim objected to for a total of nine is attached.

I.   Real Party In Interest

International Business Machines Corporation, the assignee of the above-identified application, is the real party in interest.

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II.   Related Appeals and Interferences

There are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III.   Status of Claims

A.   **TOTAL NUMBER OF CLAIMS IN THE APPLICATION**

There are nine claims in this Application.

B.   **STATUS OF ALL CLAIMS**

1.   Claims originally presented: 1 -9

2.   Claims cancelled: None

3.   Claims pending: 1-9

4.   Claims allowed: None

5.   Claims finally rejected: 1-9

C.   **CLAIMS ON APPEAL**

Claims 1-9

IV.   Status of Amendments

No amendment was filed following final rejection.

V.   Summary of the Invention

The present invention relates to a method for assigning a graphical user interface (GUI) agent to assist a user through a particular task. The assignment is carried out by the inventive method, which uses cluster analysis to optimally

determine what kind of GUI agent (guide or wizard or none) is best suited for assisting a user in accomplishing a user chosen task. In the preferred embodiment, the inventive method analyzes a set of user task characteristics. Clusters, based on the characteristics common to tasks comprising the clusters, are assigned a specific class of agents so that when a user invokes a task, the appropriate intelligent GUI agent is displayed.

Applicants recognize a technical problem in determining optimal assignment of intelligent agents to human-computer interaction. Specification, page 4, line 17 through page 5, line 1.

Applicants disclose, on pages 9-11, as part of the inventive process, determining the universe of tasks which are candidates for the application of intelligent interface agents. Each of the tasks is then evaluated by a representative sample of potential users in order to determine the level of difficulty, importance and frequency. This assessment results in a measured score for each variable for each user in the sample. After ipsatizing sample scores, statistical processes are used to analyze the sample scores. Significance is determined by evaluating the probability that a result would occur by chance in a set of multiple trials. In the preferred embodiment this probability must be less than a given value.

Another statistical analysis, McLean's multivariate clustering analysis, is used to cluster tasks into mutually exclusive clusters. The analysis continues until distinguishable clusters are found. The distinguishable clusters of tasks are then

assigned guide or wizard agents, which will be provided to a user to facilitate the user's execution of a task in that cluster.

Applicants' technique for choosing an agent for a task proceeds from an examination of all possible tasks. Statistical analysis is performed on those tasks based on the variables of frequency, level of difficulty and importance. See specification, pages 7, line 15 through page 9, line 13. More particularly, the process for determining which intelligent GUI agent to provide the user of a given task is described with reference to Figure 3 in the instant application.

VI.   Issues

The issues to be determined in this Appeal are:

1.   Whether claims 1-9 describe statutory subject matter under 35 U.S.C. § 101.

2.   Whether claims 1-9 are anticipated by U.S. Patent No. 5,790,789 to Suarez (Suarez) under 35 U.S.C. § 102.

VII.   Grouping of Claims

Group 1   claims 1, 5 and 8

Group 2   claims 2, 3, 6 and 9

Group 3   claims 4 and 7

VIII. Argument

A.   35 U.S.C. § 101 is satisfied by claims 1-9

Applicants maintain their claims 1-9 describe subject matter which is statutory under 35 U.S.C. § 101. Claims 1, 5 and 8 are essentially method, apparatus, and program product analogues to each other. Each recites the elements of receiving information, performing statistical analysis on that information to determine groups of tasks, associating agents with the groups determined through the statistical analysis and displaying an agent so associated with a group, which group contains the task chosen by a user.

Applicants' invention as claimed facilitates the man/machine interface by providing an appropriate GUI agent to a user as a function of the task chosen by a user. 'Appropriate' in this context means an agent assigned to a group of tasks containing the task so chosen by the user.

Applicants refer to *AT&T v. Excel Communications*, 172 F.3d 1352, 1353, CAFC. That decision notes that the Supreme Court has construed § 101 broadly as to "include anything under the sun that is made by man." The Court discusses that mathematical formulas alone with no use recited in the claim are not statutory. Where there is a use recited, that is, the mathematical formula or algorithm has been reduced to a practical application, then the invention as claimed fits within the constrains of § 101. *AT&T*, 172 F.3d 1352, 1357. In *AT&T*, the Court also referred to its then recent decision in *State Street Bank & Trust v. Signature Financial Group, Inc.*, 149 F.3d 1368, for the proposition that a mathematical algorithm may

indeed be a part of patentable subject matter such as a machine or process if the claimed invention as a whole is applied in a useful manner.

Applicants note that *State Street*, 149 F.3d 1368, 1314, again emphasizes that the pertinent question is whether the claim as a whole is directed to statutory subject matter, it being irrelevant that a claim contains as part thereof subject matter which would not be patentable by itself. See also *Diamond v. Diehr*, 101 S.Ct. 1048. Applicants' invention is directed to determining, via a processing system, an appropriate GUI agent for a task selected by a user. Thereafter, the GUI agent is displayed to help the user through the user chosen task. Applicants' claim 1 defines a process, only one step of which is mathematical, which results in a useful result, that is, the display of the "right" agent to help the user.

The Examiner made his § 101 rejection having reference to a portion of the "35 U.S.C. § 101 Computer-Implemented Invention Guidelines Section IV.B.2.(a)(I)" (Guidelines). The Examiner asserts that the underlying process of Applicants' claims is non-statutory and refers back to Paper No. 2, the first Office Action, mailed October 14, 1998, for his reason. Having reference to claim 1, the Examiner found "no pre or post computer activity of the type that would put this claim into a safe harbor since all the activity takes place inside the computer." The Examiner cited *In re Gelrovatch and Arell*, 201 USPQ 136, 145, in deciding that claim 1 as originally filed was non-statutory.

Applicants believe their arguments advanced herein, based on cases decided by the CAFC after the Guidelines were published, overcome the

Examiner's contention regarding § 101 and the claims on appeal. The Guidelines state on page 1 that the Freeman-Walter-Abele test may be relied upon. Yet, the *State Street* court states, "After Diehr and Chakrabarty, the Freeman-Walter-Abele test has little, if any, applicability to determining the presence of statutory subject matter." 149 F.3d 1369, 1374. The court refers to *In re Alappat*, 33 F.3d 1526, 1543. As the *State Street* court continues, we are instructed to look for a "useful, concrete and tangible result". "However, after *Diehr* and *Alappat*, the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a 'useful, concrete and tangible result.'" 149 F.3d 1368, 1374. The present claims describe a technique for determining which intelligent GUI agent to present to the user-machine interface. This is, indeed, a useful, concrete and tangible result which, again, indicates that the underlying process is patentable subject matter.

B.   None of the claim groups is anticipated by Suarez

Claims 1, 5 and 8 and claims dependent therefrom are not anticipated by Suarez. It is well established that for a § 102 reference to anticipate the invention as claimed, the reference must contain <u>each</u> element of the claimed invention. "A claim is anticipated only if each and every element of the claim is found, either expressly or inherently, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil. Co.*, 814 F.2d 628, 631. Not only must the elements appear, they must interact to produce in essentially the same way the same result achieved by the claim being examined. Applicants on this basis traverse the propriety of Suarez as

a § 102 reference against their invention. The Examiner, in finally rejecting the independent claims, has applied Suarez to fewer than all the elements of the claims on appeal. Further, the Examiner has offered no specific reasons for the rejections of the dependent claims.

Using claim 1 as exemplary of Group 1 of the claims on appeal, Applicants assert that none of the claimed elements is contained in the reference. In its preamble claim 1 recites "A ... method of providing a graphical user interface agent to a user ... " The Examiner maintains that Suarez anticipates GUI agents. Applicants disagree. While Suarez shows a user 13 in the figures, there is no discussion apparent to Applicants' attorney of a GUI interface agent for facilitating a user's interaction with the system of, for example, Suarez Fig. 1 or Fig. 5.

Agents are disclosed in Suarez for essentially a single purpose—providing communication between services with which the agents are associated. For example, Suarez declares, column 6, lines 21-27, "the present distributed computing system also includes a plurality of agents executing on the computer hosts and associated with one or more of the services, wherein an agent exercises control of an associated service by manipulating the electronic messages directed to and originated from the associated services." Later, at column 6, lines 33-35, Suarez states, "...an agent within the present invention is not a static software implemented process but rather a dynamic means for controlling the services."

A service in Suarez as defined in column 8, line 66, is a unit of work. In column 10, line 13-15, Suarez describes that "An agent exists to provide a service

and services are accessed only through agents." The only instances of user action description occur in the context as disclosed at column 15, lines 39-42. "Specifically, objects within the present distributed computing system include user-defined or market services, user-defined agents..." Suarez states, column 15, line 61-65, "Those services not viewed as a system service are also referred to as a market service. System based services are associated with corresponding system agents, while most user-defined services are associated with one or more user-defined agents."

The Examiner specifically referenced Suarez column 25, line 65 through column 26, line 15 for disclosing GUI agents provided to assist the user. Applicants traverse. That portion of Suarez describes how agents may be controlled by the user as well as the system and sets out that a user can exercise numerous types of control. There is also described a way in which user control may be accomplished. Applicants assert that Suarez's teaching of enabling a user to assert control over an agent in no way anticipates Applicants' claimed invention for choosing, via the processing system, an appropriate GUI agent for a group of tasks and thereafter displaying that GUI agent when the user attempts to perform a task in that group.

Four steps comprise the method of claim 1. Those steps are: "receiving data...; performing multivariate analysis on said data...; storing an association ...; and ... displaying an intelligent agent..." The second of those steps relates to the determination of mutually exclusive groups of tasks using multivariate statistical analysis. The Examiner asserts that "Suarez clearly shows" this feature in column

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26, lines 25-31. The Examiner notes that that portion of Suarez shows that agents maintain statistical information regarding processing time, frequency of requests, frequency of service requests, etc. and finds, "as a matter of fact," that the amendments to Applicants' claims 1, 5 and 8 did not overcome the prior art. Applicants continue to traverse the Examiner's interpretation of the reference as set out below.

The maintenance of statistical information by agents, as described in Suarez, is on its face different from Applicants' use of multivariate statistical analysis on information gathered on three variables: task difficulty, task importance and task frequency. See specification page 9, lines 7-9. Applicants describe in detail how mutually exclusive groups of tasks are determined beginning at page 9, line 15 through page 11, line 16. Applicants then recite in the first two steps of claim1:

> "receiving data assessing at least two user assessment variables for each of a plurality of tasks;
>
> performing multivariate analysis on said data to derive from said plurality of tasks at least as many mutually exclusive clusters of tasks as there are intelligent agents to assign;"

Applicants continue to assert, therefore, that the applied language from Suarez in no way anticipates, does not clearly show, and in no manner suggests these steps.

The Examiner then refers to previous office actions, the positions in which Applicants have continued to traverse regarding the applicability of the teachings of Suarez to the present invention. There is no teaching in Suarez of user assessment variables, the performance of multivariate statistical analysis to determine exclusive

groups of tasks based on those user assessment variables, thereafter associating GUI agents with the mutually exclusive groups, and finally, upon user selection of a task, providing the user with an appropriate GUI intelligent agent.

In a prior office action, the Examiner pointed to Suarez, column 6, lines 58 through column 7, line 14 for a teaching of "receiving data assessing at least two user assessment variables for each of a plurality of tasks." Applicants continue to traverse based on the plain meaning of the words used in that section of Suarez such as "Advanced Agent technology allow users to intelligently control the overall behavior of the agents..." at column 6, lines 64-66. One distinct advantage of Applicants' invention is that a system embodying the invention, see claims 1, 5 and 8, chooses the appropriate agent to display to facilitate the user's interaction with the system.

The Examiner pointed to Suarez, column 10, lines 1-11, to anticipate Applicants' "storing an association linking each of said intelligent agents with one of said mutually exclusive clusters." As noted above, Suarez column 10, lines 1-11 states inter alia "A work item is a collection of data... and is typically associated with specific processes..." That section of Suarez is preceded by a description that states that attachments, which include agents, are associated with each process. Applicants maintain that neither in that applied section of Suarez, nor indeed anywhere in Suarez, is there a teaching or suggestion of "storing an association linking each of said intelligent agents with one of said mutually exclusive clusters (of tasks)" as applicants' claim 1 recites. That element of claim 1 also appears in

analogous claims 5 and 8. Suarez only associates services with agents and states that services cooperate to perform tasks. Therefore, applicants conclude and assert that the third step of the method of claim 1 is not in anyway anticipated by Suarez.

The present invention as described in the claims on appeal, it must be emphasized, relates to improving the user-machine interface. The inventive method, apparatus and program product of claims 1, 5 and 8, respectively, conclude with displaying to the user the GUI agent associated with a cluster of tasks including the task selected by the user. Suarez does not teach associating tasks with GUI agents. Fig. 2 of Suarez shows users 13, but nowhere does the reference address, describe or show any particular interface displayed to a user 13. Suarez discusses function interfaces, column 24, line 47, and application interfaces, column 30, lines 4-6, but no graphical user interfaces are ever mentioned. Applicants, therefore, conclude and assert that the last step of claim 1 is not anticipated by Suarez. Claim 1 recites, in pertinent part, "upon user selection of a task, displaying an intelligent associated with a cluster containing the task selected by the user."

Applicants maintain that none of the elements of the Group 1 claims is individually anticipated by Suarez. Nothing in Suarez suggests the combination of elements comprising the invention as claimed.

With regard to Applicants' dependent claims, the Examiner apparently rejects them as anticipated by Suarez as well. All the claims depending from claims 1 and

5, claims 2-4, 6, 7 stand finally rejected. All relate to and describe further limitations of Applicants' method and apparatus claim elements reciting multivariate statistical analyses. As argued above regarding independent claims 1, 5 and 8, no "... multivariate analysis of data accessing at least two user assessment variables..." is found in Suarez, either at column 26, lines 25-31 or any place else. "In particular, agents maintain information such as statistical information relating to the processing time required to execute an associated service. The frequency of requests (i.e., number of times the agent has executed within a specific time frame); and the information concerning the recent requests for services including the last service/agent to invoke or request the controlled service" does not, Applicants assert, in any way anticipate or suggest the second element of each of their independent claims, and therefore, the dependent claims which further elaborate thereon.

The claims of Group 2 are exemplified by claim 6. It should be noted that claim 9 recites the same limitations as claim 6. Claim 6 describes apparatus; claim 9, computer program product. Claim 6 has been finally rejected. Claim 9 is objected to as depending from a rejected claim. As noted above, claim 6 recites limitations pertaining to the second element of each independent claim, "transforming said multivariate data ... and performing univariate analyses ... to validate cluster groupings." Because applicants believe, and have argued above, that no statistical analysis equivalent to that in the Group 1 claims on appeal is taught or suggested by Suarez, applicants maintain that there is, therefore, no

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teaching or suggestion in Suarez which is anticipatory of the claims comprising Group 2.

The claims comprising Group 3 are likewise asserted to be patentably distinguished over Suarez based on reasoning similar to that advanced with regard to Group 2 claims.   Group 3 claims also recite elements further describing multivariate analysis. Further, the claims in Group 3 recite limitations on "said plurality of intelligent agents" set forth in the independent claims from which the claims of Group 3 depend.

Group 3 claims describe "multivariate analysis" to include "separating said tasks ...; performing ... analysis ... to determine whether ... distinct; and if not, ... creating an additional group and performing said ... analysis again until ... distinct" As argued above, applicants assert that not only does Suarez fail to teach any "association linking each of said intelligent agents with one of said statistically distinct groups" of tasks, the reference in no way anticipates Applicants' claimed multivariate analysis elements.

In summary, Applicants believe that a rejection of the claims under 35 U.S.C. § 101 is erroneous in view of the court's statements in AT&T and State Street. Further, the claims on appeal are not anticipated by Suarez because, as pointed out above, each and every element of their claims is absent from the Suarez reference. "A claim is anticipated and therefore invalid only when a single prior art reference discloses each and every limitation of the claim." Glaxo Inc. v. Novopharm, Ltd., 52 F.3d 1043, 1047.

IX.   Relief Sought

Applicants urge the Board to find the § 101 rejection of claims 1, 5 and 8

overcome; claims 1-8 not anticipated by Suarez, and claim 9, therefore, no longer

objectionable as dependent from a rejected claim.

Respectfully submitted,

By: _Andrea Pair Bryant_

Andrea Pair Bryant
Registration No. 28,191

October 11, 2000

Appendix

The claims involved in this appeal are set forth below:

1. A computer implemented method of providing a graphical user interface agent to a user performing a task in a computer system comprising a processor, an operating system, memory, and a plurality of intelligent agents, comprising the steps of:

> receiving data assessing at least two user assessment variables for each of a plurality of tasks;

> performing multivariate analysis on said data to derive from said plurality of tasks at least as many mutually exclusive clusters of tasks as there are intelligent agents to assign;

> storing an association linking each of said intelligent agents with one of said mutually exclusive clusters; and

> upon user selection of a task, displaying an intelligent agent associated with a cluster containing the task selected by the user.

2.   The method of claim 1, further comprising the step of:

transforming said multivariate data to eliminate individual respondent differences.

3.   The method of claim 2 further comprising the step of:

performing univariate analysis on each of said assessment variables to validate cluster derivation.

4.   The method of claim 1, wherein said intelligent agents include a first "wizard" agent applicable to infrequent, difficult tasks and a second "guide" applicable to frequent tasks, and wherein the multivariate analysis step comprises the steps of:

separating said tasks into two groups based on a frequency variables;

performing multivariate statistical analysis on said two groups to determine whether the groupings are statistically distinct;

if not distinct, creating an additional group and performing said multivariate analysis again until a statistically distinct set of groups is found.

5.   A system for providing a graphical user interface agent to a user performing a task on a computer system comprising a processor means, storage means and input/output means, and a plurality of intelligent agents, the system comprising:

> means for receiving data assessing at least two user assessment variables for each of a plurality of tasks;

> means for performing multivariate statistical analysis on said data to determine at least as many statistically distinct groups of tasks as there are intelligent agents to assign;

> means for storing in said storage means an association linking each of said intelligent agents with one of said statistically distinct groups; and

> means, operable upon user selection of a task, for displaying an intelligent agent associated with a group of tasks containing the task selected by the user.

6.   The system of claim 5, further comprising:

> means for transforming said multivariate data to eliminate individual respondent differences; and

> means for performing univariate analyses on each of said assessment variables to validate cluster groupings.

7.   The system of claim 5, wherein said intelligent agents include a first "wizard" agent applicable to infrequent, difficult tasks and a second "guide" applicable to frequent tasks, and wherein the means for performing multivariate analysis comprises:

> means for separating said tasks into two groups based on a frequency variable;

> means for performing multivariate statistical analysis on said two groups to determine whether the groupings are statistically distinct;

> if not distinct, means for creating an additional group and means for performing said multivariate analysis again until a statistically distinct set of groups is found.

8.   A computer program product including a computer readable medium having computer program logic recorded thereon for use in a data processing system for providing a graphical user interface agent to a user performing a task comprising:

means for receiving data assessing at least two user assessment variables for each of said tasks;

means for performing multivariate statistical analysis on said data to determine at least as many statistically distinct clusters of tasks as there are intelligent agents to assign;

means for storing in said storage means an association linking each of said intelligent agents with one of said statistically distinct clusters; and

means for displaying an intelligent agent using a stored association when a user of said data processing system executes a task from one of said statistically distinct clusters.

9.   The computer program product of claim 8, further comprising:

means for transforming said multivariate data to eliminate individual

respondent differences; and

means for performing univariate analyses on each of said assessment

variables to validate cluster groupings.